智能型流動變送器使用說明書

IP67 CE SGS RoHS

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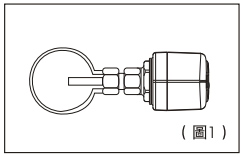
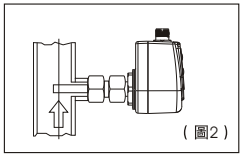
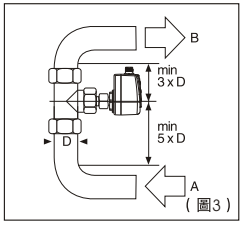
安裝要求

1. 在水平鋪設的管道中，盡可能從側邊安裝感測器（圖1）
   ・當變送器安裝在管道底部時，應注意清除沉積物
   ・當變送器安裝在管道頂部時，應注意裝滿需檢測的介質
2. 在垂直鋪設的管道中，將流動變送器安裝在介質向上流動處（圖2）

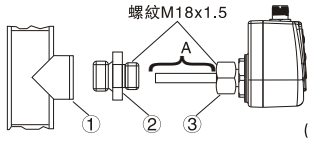

（圖1）


（圖2）

3. 爲避免故障，應注意流動感測器和彎頭，閥門及橫截面有變化之處或諸如此類地方的最小距離（圖3）：
   ・最小5X管道入口處直徑（A）
   ・最小3X管道入口處直徑（B）
   ・管道直徑（D）



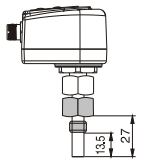
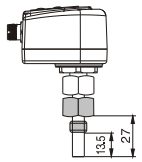
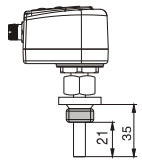
（圖3）



（圖4）

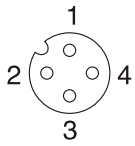
1. 給螺母 ③ 和所有的螺紋添加潤滑油，以便螺母可方便地擰鬆和擰緊。（圖4）
   注意：變送器探頭（A）上不能使用潤滑油。
2. 將一合適的轉接頭 ② 與過程接頭 ① 旋緊。（圖4）
3. 將流動變送器插入轉接頭，對準後擰緊螺母 ③，（最大擰緊扭矩50Nm）。（圖4）

變送器插入深度：插入管道中最小12mm，使用轉接頭（需單獨訂貨）可確保正確的深度。
注意：變送器探頭不可碰到管壁。

安裝尺寸 帶M12接頭	安裝尺寸 帶G1/4"接頭	安裝尺寸 帶G1/2"接頭
		

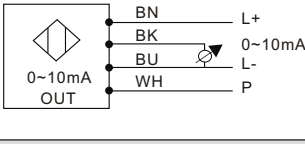
端子圖及系統連線

■ 四芯插件平面圖（見下圖）



■ 四芯插件接脚定義
PIN1：L+,電源正極（BN）
PIN2：P, 編程線（WH）
PIN3：L–, 電源負極（BU）
PIN4：4~20mA輸出（BK）

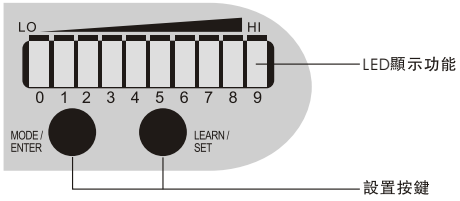
■ 接線圖



P=編程線（用於遠程調整）
EMA芯線顏色：
1=BN（褐色）　2=WH（白色）
3=BU（藍色）　4=BK（黑色）

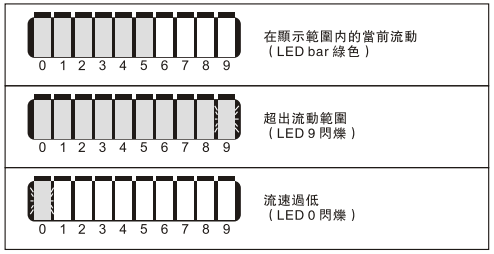
目錄設定及指示燈狀態

■ 控制面板



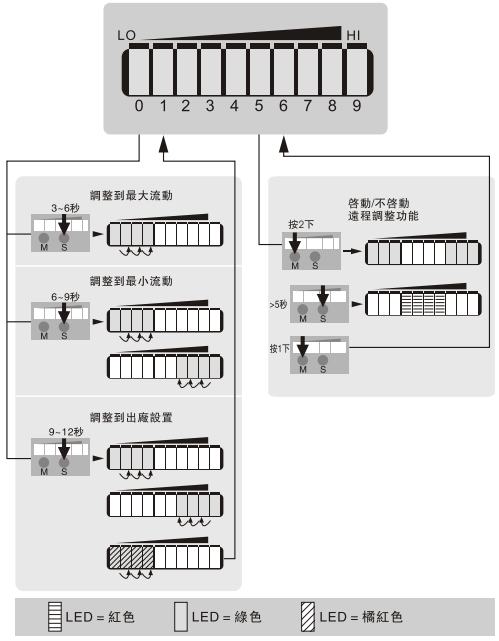
■ 設置按鍵定義
Mode / Enter: 目錄項的選擇和確認。
Learn/Set: 調整到最大 / 最小流動；值的設置（按住按鍵，滾動顯示；按下按鍵，數值遞增）。

■ 顯示功能(運行模式)



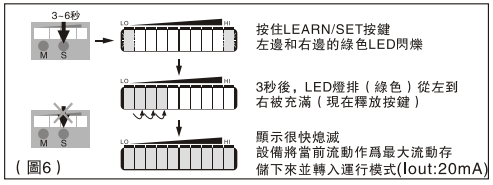
■ 功能及參數設定

1. 目錄結構



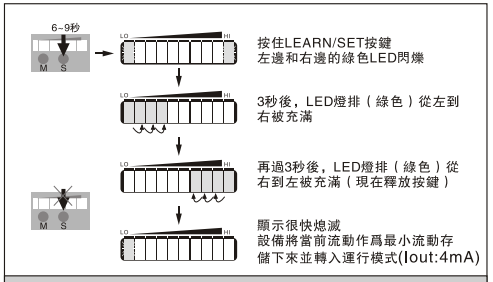
2. 檢測範圍的設定

・調整到最大流動（HI–Teach），接通電源，大約8秒後，設備準備操作。容許介質以所需的最大流動通過系統。設備檢測當前流動並設定該值作爲LED的最高顯示值。(Iout:20mA)（圖6）



（圖6）

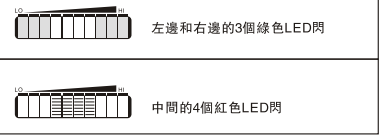
・調整到最小流動 / 停止流動（LO–Teach），流動感測器檢測當前流動，並設定該值作爲LED的最小顯示值(Iout:4mA)。在正常的運行中，當流動低於該值時（或當它停止流動時），第一個綠色的LED（LED 0）閃爍。(見下圖)
注意：LO–Teach操作只能在HI–Teach後進行。



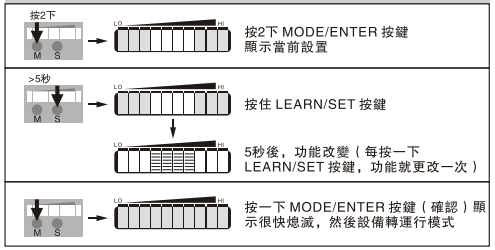
容許介質以所需的最小流動通過系統或停止流動

3. 啓動/關閉遠程調整功能

・啓動/關閉

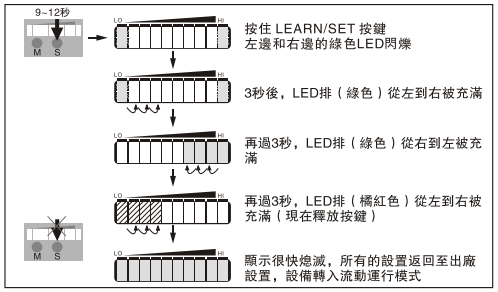


・遠程調整功能設置



如果該功能啓動,連接針脚2和L+可以進行遠程調整.

4. 返回出廠設置



5.遠程調整

調整到最大流動（HI–Teach）

接通電源，大約8秒後，變送器準備操作。容許介質以所需的最大流動通過系統。將遠程調整線(WH)與電源L+相接,左邊和右邊的LED開始閃爍約2~3 秒後,LED燈排（綠色）從左到右被充滿，此過程中斷開連線，顯示熄滅，將當前流速作爲最大流速存儲下來並轉入操作模式(Iout:20mA)。

調整到最小流動 / 停止流動（LO–Teach）

容許介質以所需的最小流動通過系統。將遠程調整線(WH)與電源L+相接,左邊和右邊的LED開始閃爍約2~3 秒後,LED燈排（綠色）從左到右被充滿，再過約5~6 秒後,LED燈排從右到左被充滿,此過程中斷開連線，顯示熄滅，將當前流速作爲最小流速存儲下來並轉入操作模式(Iout:4mA)。

6. 按鍵加鎖/解鎖功能

流動變送器具備電子鎖定功能，防止已設定的參數被擅自更改，當接痛電源，鍵盤處於鎖定狀態。

- 加鎖：該設備具有自動鎖定按鍵功能，當處於運行模式時，如檢測到2分鐘內未有按鍵按下，則自動鎖定鍵盤，正常檢測流速的變化和顯示，並可報警且輸出控制量。
- 解鎖：同時按下兩個按鍵，並持續10秒，中間兩個綠色LED燈閃爍提示則鍵盤鎖解開，用户可通過鍵盤進行調節相關參數。

技術參數

	工作電壓 [V]	20...36V DC
	輸出功能	0~10mA
	輸出最大負載[ohm]	500
	輸出精度	±10%(常温以25℃水爲介質進行標定)
	反極保護	是
	耗用電流 [mA]	< 80
	介質最大的温度漂移 [K/min]	300
	抗壓强度 [bar]	300
液體介質	介質温度 [℃]	–25...80
液體介質	監測範圍 [cm/s]	3...60
氣體介質	介質温度 [℃]	–25...80
氣體介質	監測範圍 [cm/s]	200...800
	啓動延時 [s]	< 8
	輸出響應時間 [s]	< 2
	防護等級	IP67
使用環境	温度[℃]	–25...80
使用環境	濕度	15...85%
使用環境	抗衝擊性 [g]	50
使用環境	抗震動[g]	20
存儲	温度[℃]	–25...+70
存儲	濕度	15...95%
	功能顯示 LED	3色LED x 10
	認證	通過 CE和 RoHS 認證

智能型流动传感器使用说明书

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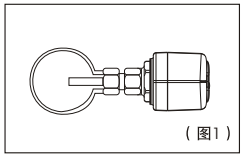
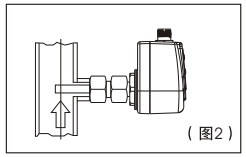
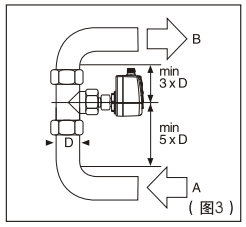
安装要求

1. 在水平铺设的管道中，尽可能从侧边安装传感器（图1）
   ・当传感器安装在管道底部时，应注意清除沉积物
   ・当传感器安装在管道顶部时，应注意装满需检测的介质
2. 在垂直铺设的管道中，将流动传感器安装在介质向上流动处（图2）

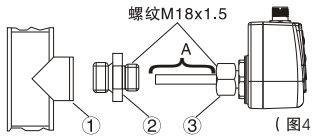

（图1）


（图2）

3. 为避免故障，应注意流动传感器和弯头，阀门及横截面有变化之处或诸如此类地方的最小距离（图3）：
   ・最小5X管道入口处直径（A）
   ・最小3X管道入口处直径（B）
   ・管道直径（D）



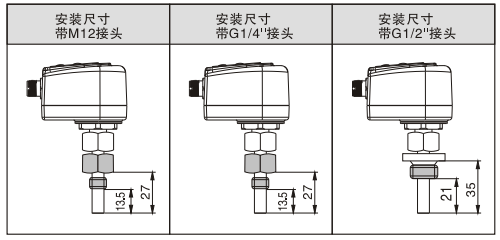
（图3）



（图4）

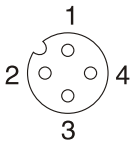
1. 给螺母 ③ 和所有的螺纹添加润滑油，以便螺母可方便地拧松和拧紧。（图4）
   注意：传感器探头（A）上不能使用润滑油。
2. 将一合适的转接头 ② 与过程接头 ① 旋紧。（图4）
3. 将流动传感器插入转接头，对准后拧紧螺母 ③，（最大拧紧扭矩50Nm）。（图4）

传感器插入深度：插入管道中最小12mm，使用转接头（需单独订货）可确保正确的深度。
注意：传感器探头不可碰到管壁。



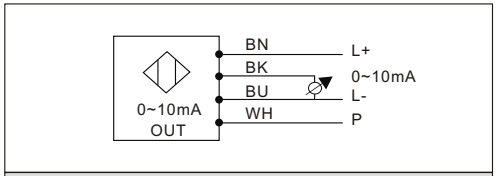
端子图及系统连线

■ 四芯插件平面图（见下图）



■ 四芯插件接脚定义
PIN1：L+ ,电源正极（BN）
PIN2：P, 编程线（WH）
PIN3：L–, 电源负极（BU）
PIN4：4~20mA输出（BK）

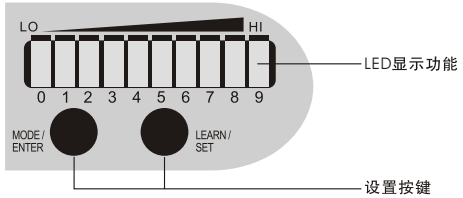
■ 接线图



P=编程线（用于远程调整）
EMA芯线颜色：
1=BN（褐色）　2=WH（白色）
3=BU（蓝色）　4=BK（黑色）

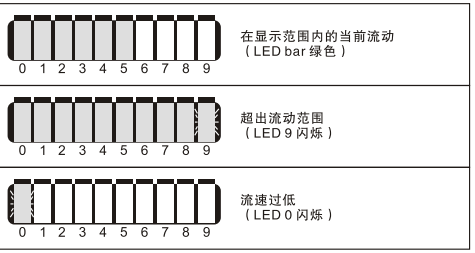
菜单设定及指示灯状态

■ 控制面板



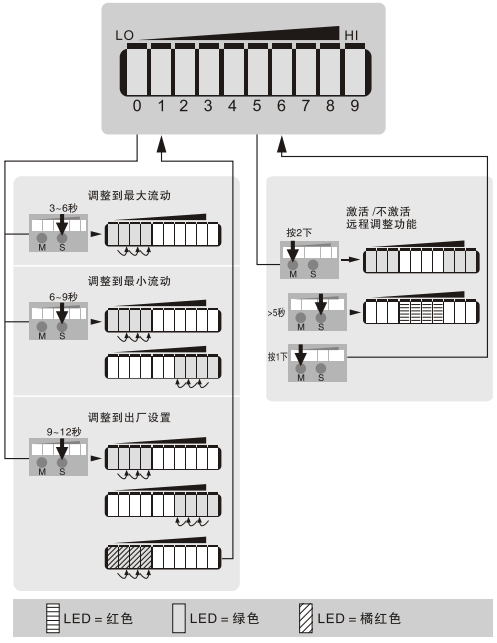
■ 设置按键定义
Mode / Enter: 菜单项的选择和确认。
Learn/Set: 调整到最大 / 最小流动；值的设置（按住按键，滚动显示；按下按键，数值递增）。

■ 显示功能(运行模式)



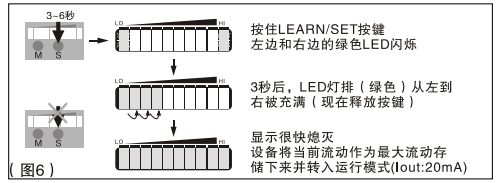
■ 功能及参数设定

1. 菜单结构



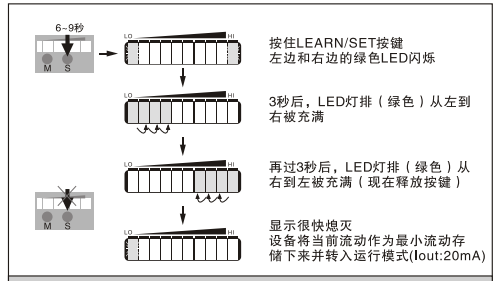
2. 检测范围的设定

・调整到最大流动（HI–Teach），接通电源，大约8秒后，设备准备操作。容许介质以所需的最大流动通过系统。设备检测当前流动并设定该值作为LED的最高显示值。(Iout:20mA)（图6）



（图6）

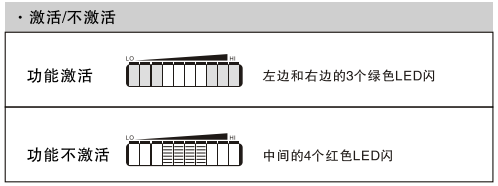
・调整到最小流动 / 停止流动（LO–Teach），流动传感器检测当前流动，并设定该值作为LED的最小显示值(Iout:4mA)。在正常的运作中，当流动低于该值时（或当它停止流动时），第一个绿色的LED（LED 0）闪烁。(见下图)
注意：LO–Teach操作只能在HI–Teach后进行。



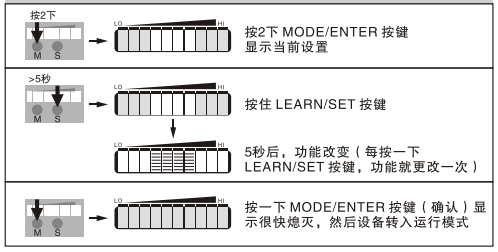
容许介质以所需的最小流动通过系统或停止流动

3. 激活/不激活远程调整功能

・激活/不激活

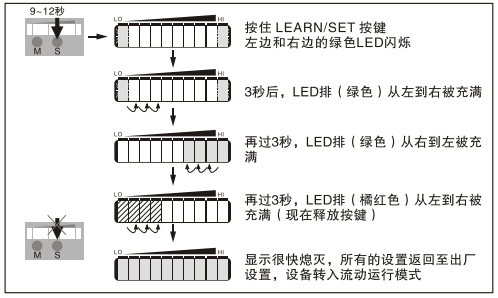


・远程调整功能设置



如果该功能激活,连接针脚2和L+可以进行远程调整.

4. 返回出厂设置



5.远程调整

调整到最大流动（HI–Teach）

接通电源,大约8秒后，传感器准备操作。容许介质以所需的最大流动通过系统。将远程调整线(WH)与电源L+相接,左边和右边的LED开始闪烁约2~3 秒后,LED灯排（绿色）从左到右被充满，此过程中断开连线，显示熄灭，将当前流速作为最大流速存储下来并转入操作模式(Iout:20mA)。

调整到最小流动 / 停止流动（LO–Teach）

容许介质以所需的最小流动通过系统。将远程调整线(WH)与电源L+相接,左边和右边的LED开始闪烁约2~3 秒后,LED灯排（绿色）从左到右被充满，再过约5~6 秒后,LED灯排从右到左被充满,此过程中断开连线，显示熄灭，将当前流速作为最小流速存储下来并转入操作模式(Iout:4mA)。

6. 按键加锁/解锁功能

流动传感器具备电子锁功能，防止已设定的参数被擅自更改，当接通电源时，键盘处于锁定状态。

- 加锁：该设备具有自动锁定按键功能，当处于运行模式时，如检测到2分钟内未有按键按下，则自动锁定键盘，正常检测流速的变化和显示，并可报警且输出控制量。
- 解锁：同时按下两个按键，并持续10秒，中间两个绿色LED灯闪烁提示则键盘锁解开，用户可通过键盘进行调节相关参数。

技术参数

	工作电压 [V]	20...36V DC
	输出功能	0~10mA
	输出最大负载[ohm]	500
	输出精度	±10%(常温以25℃水为介质进行标定)
	反极保护	是
	耗用电流 [mA]	< 80
	介质最大的温度漂移 [K/min]	300
	抗压强度 [bar]	300
液体介质	介质温度 [℃]	–25...80
液体介质	监测范围 [cm/s]	3...60
气体介质	介质温度 [℃]	–25...80
气体介质	监测范围 [cm/s]	200...800
	启动延时 [s]	< 8
	输出响应时间 [s]	< 2
	防护等级	IP67
使用环境	温度[℃]	–25...80
使用环境	湿度	15...85%
使用环境	抗冲击性 [g]	50
使用环境	抗震动[g]	20
存储	温度[℃]	–25...+70
存储	湿度	15...95%
	功能显示 LED	3色LED x 10
	认证	通过CE和ROHS 认证

ema

FLOW SENSORS MANUAL

IP67 CE SGS RoHS

www.ema-electronic.com

Installation

1.It is suggested to install the sensor in the sides while installing it in the horizontal pipe.(Fig.1)
- It is supposed to clear up the sediments while installing the sensor in the bottom of the pipe.
- It is supposed to pay attention to the medium occupied the pipe while installing the sensor in the top of the pipe.

2.Install the sensor in the place which the medium flows upward while installing it in the vertical pipe.(Fig.2)

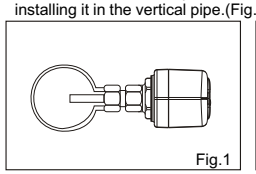


Fig.1

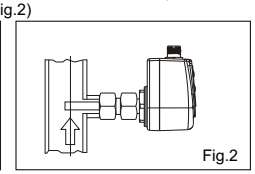
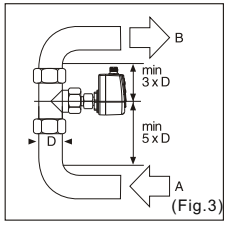
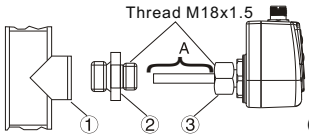


Fig.2

3.Avoiding damage, the user should watch out for the minimum distance between the sensor and the curve, the valve, and the cross section which changes. (Fig.3):
- Entrance (A)
- Exit (B)
- Diameter of the pipeline(D)



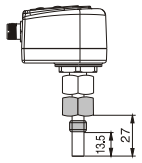
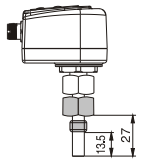
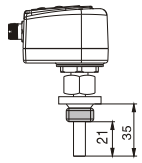
(Fig.3)



(Fig.4)

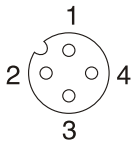
1.To screw the nut smoothly, please add the lubricant on the nut ③ and the threads. (Fig.4)
Notice: It is disallowed to add lubricant on the sensor.
2. Screw a suitable connector ② to the joint ①. (Fig.4)
3. Insert the sensor to the connector and then screw the nut ③ (The biggest screwing torque: 50Nm). (Fig.4)

The depth of insertion: The minimum depth inserting to the pipeline is 12mm. To insure the correct depth, the user can use a connector (Accessory; optional order).
Notice: The probe of sensor is not allowed to contact the wall of the pipe.

Mounting size M12 connector	Mounting size G1/4"connector	Mounting size G1/2 "connector
		

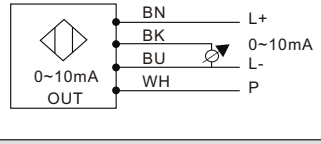
Pinout & Connection

■ Pinout(The following figure)



■ Pinout definition
PIN1：L+, Positive pole（BN）
PIN2：P, Programming wire（WH）
PIN3：L- ,Negative pole（BU）
PIN4：4~20 output（BK）

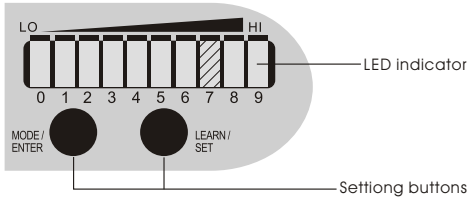
■ Connection



Programming wire (for remote adjustment)
Core color:
1=BN (Brown)　　2=WH (White)
3=BU (Blue)　　4=BK (Black)

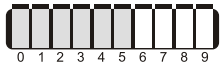
Menu setting and Indicator status

■ Controls and visual indication

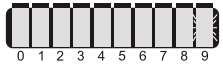


■ Button definition
MODE / ENTER: Selection / Confirmation
Learn/Set: Adjust to the biggest / smallest flow; value setting (Keep pressing button to scroll the display; Press button once to increase the value progressive.)

■ Display (Operation)



In the display range (LED bar Green)



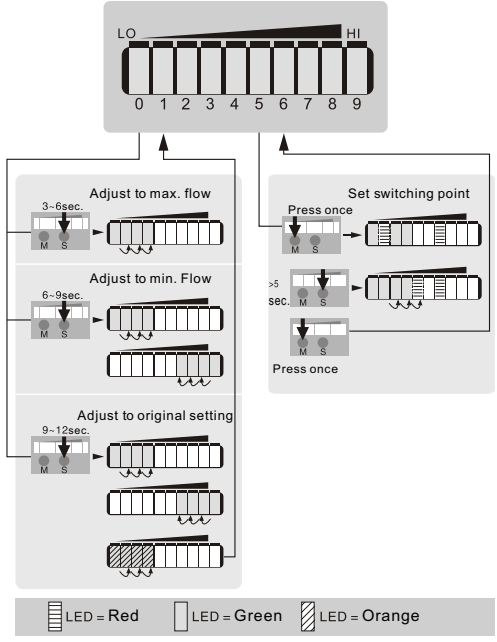
Over the flow range (LED 9 Flash)

Current is too low (LED 0 Flash)

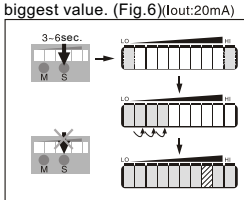
Switching point display (SP) :
LED Orange: Flow>SP; LED Red: Flow<SP

■Menu setting

1. Menu structure

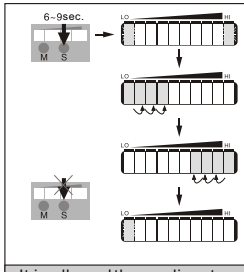


2. Sensing range setting
Adjust to the biggest flow.(HI-Teach) Connect up the power. The sensor is ready to run after 8 sec., and then makes the biggest flow required by the medium pass the system. The sensor detects the current flow and sets the value when the LED displays the biggest value. (Fig.6)(Iout:20mA)



Press LEARN/SET button, then the left and right green LED both flash.
3 sec. later, LED segments turn all green (green light) from left to right. (Loose the button at this moment.)
The light is extinct soon and the current flow will be record as the biggest one and then the sensor alters to operation mode (Iout:20mA).

・Adjust to the smallest flow / flow stop. The sensor detects the current flow and sets the value as the smallest display value of LED (Iout:4mA).In the normal operation, the first green LED (LED 0) flashes when the flow smaller than this value (or when the flow stops).
Notice: LO-Teach operation is only allowed to be done after HI-Teach.



Press LEARN/SET button, then the left and right green LED both flash.
3 sec. later, LED segments turn all green (green light) from left to right.
More 5 sec. later, LED segments turn all green again (green light) from right to (Loose the button at this moment.)
The light is extinct soon and the current flow will be record as the smallest one and then the sensor alters to operation mode (Iout:4mA).

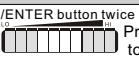
It is allowed the medium to pass the system or stop flow by the least flow required.

3. Start/Non-start remote adjustment

・On/off

On		3 green LED lights flash in both left and right sides.
Off		4 red LED lights flash in the center.

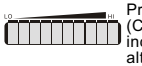
・Remote adjustment



Press MODE/ENTER button twice to display the current setting.

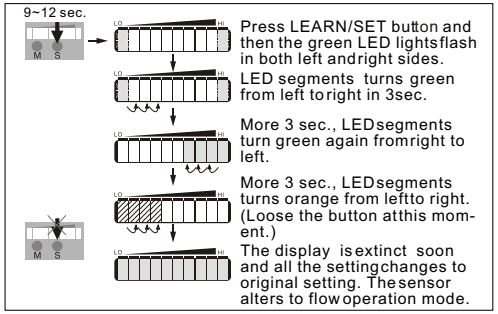
Press LEARN/SET button

The function changes in 5 sec. (The function is changing as press the LEARN/SET button.)


Press MODE/ENTER button. (Confirmation) The display is extinct soon and then the sensor alters to operation mode.

After actirating this function, connect PIN2 and L+ to run remote adjustment.

4. Original setting


9~12 sec.
M S
LO HI
Press LEARN/SET button and then the green LED lights flash in both left and right sides.
LED segments turns green from left to right in 3sec.
More 3 sec., LED segments turn green again from right to left.
More 3 sec., LED segments turns orange from left to right. (Loose the button at this moment.)
The display is extinct soon and all the setting changes to original setting. The sensor alters to flow operation mode.

5. Remote adjustment

Adjust to biggest flow (HI-Teach):
connected to power,the sensor is ready to run after 8 sec. and allowed the biggest flow required by medium to pass the system. After connect remote adjust wire (RED) to power L+,both left and right LED start flashing for 2-3 sec. LED segments turn all green (green light) from left to right. Loose the button during this procedure, the light extinct soon and the current rate of flow will be record as the biggest one and then this sensor alters to operation mode (Iout:20mA).

Adjust to smallest flow / flow stop（LO-Teach）:
The sensor detects the current flow and sets the value as the smallest display value of LED. In the normal operation, the first green LED (LED 0) flashes when the flow smaller than this value.(or when the flow stops)After connect remote adjust wire (RED) to power L+, both left and right LED start flashing for 2-3 sec. LED segments turn all green (green light) from left to right and then turn green again from left to right in 5-6sec. Loose the button during this procedure, the light is extinct soon and the current rate of flow will be record as the smallest one and then this sensor alters to operation mode(Iout:4mA).

6. Lock/Unlock

This sensor can be locked electrically to escape the parameter set from changed accidentally .The buttons are under lock while repower in.

・Lock：This sensor owns automatic button lock function. When there is no button being pressed in 2 minutes, it will lock the button automatically. Under locked the detection of changes of the flow rate is running regularly, outputting and warning remote adjusting.

・Unlock：Press two buttons simultaneously and keep pressing for 10sec. The user can adjust relevant parameters by the buttons. While the 2 greenLED in the center flash.

Technical parameter

	Operating Voltage [V]	20...36V DC
	Output	0~10mA
	Max.output load [ohm]	500
	Outputaccuracy	±10%(Standard under the normal temp. 25℃ of water)
	Reverse polarity protection	YES
	Current consumption [mA]	< 80
	Temperature gradient of medium [K/min]	300
	Pressure rating [bar]	300
Liquid medium	Temperature [℃]	-25...80
	Monitor range [cm/s]	3...60
Gas medium	Temperature [℃]	-25...80
	Monitor range [cm/s]	200...800
	Power-on delay time [s]	< 8
	Output response time [s]	< 2
	Protection classification	IP67(IEC 60529) / (UL50)
Operating environment	Temperature [℃]	-25...80
	Humidity	15...85%
	Resistance to shock [g]	50 (DIN / IEC 68-2-27, 11 ms)
	Resistance to vibration[g]	20 (DIN / IEC 68-2-6, 55-2000 Hz)
Storage	Temperature [℃]	-25...+70
	Humidity	15...95%
	Display LED	3 colors LED x 10
	Certification	CE; RoHS